

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel



Synchro flange

- Compact design
- Aids for start up and operation: diagnostic LED, preset key with optical response (only with MT), status information
- Output Tristate short circuit-proof
- Gray or Binary code
- Encoder monitoring



TECHNICAL DATA mechanical

Housing diameter	58 mm
Shaft diameter	6 mm / 10 mm (Solid shaft) 10 mm / 12 mm (Hub shaft)
Flange (Mounting of housing)	Synchro flange, Clamping flange, Tether, Square flange
Protection class shaft input (EN 60529)	IP64 or IP67
Protection class housing (EN 60529)	IP64 or IP67
Shaft load axial / radial	40 N / 60 N
Axial endplay of mounting shaft (hubshaft)	± 1.5 mm
Radial runout of mating shaft (hubshaft)	± 0.2 mm
Max. speed	max. 10 000 rpm (continuous), max. 12 000 rpm (short term)
Starting torque typ. ³	≤ 0.01 Nm
Moment of inertia	ca. 3.8 x 10 ⁻⁶ kgm ²
Vibration resistance (DIN EN 60068-2-6)	100 m/s ² (10 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s ² (6 ms)
Operating temperature	-40 °C ... +100 °C
Storage temperature	-40 °C ... +85 °C
Weight	approx. 350 g (ST) / 400 g (MT)
Connection ²	Cable, axial or radial M23 connector (Conin), 17 pole, axial or radial Sub-D connector, 37 pole

TECHNICAL DATA electrical

Supply voltage	DC 10-30 V On request: DC 5 V
Max. current w/o load	200 mA (ST), 300 mA (MT)
Resolution singleturn	10 - 14 Bit Gray Excess: 360, 720 increments
Resolution multiturn	12 Bit
Output code	Binary, Gray, Gray Excess
Linearity	± ½ LSB
Output current	30 mA per Bit, short-circuit-proof
Control inputs	$\overline{\text{Latch}}$, $\overline{\text{Direction}}$, $\overline{\text{Tristate}}$ with ST, $\overline{\text{Tristate}}$ with MT
Alarm output	NPN-O.C., max. 5 mA

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TECHNICAL DATA electrical (continued)

Data output level

Status LED	Green = ok, red = alarm	
Supply voltage U_B	DC 5 V - 5 % +10 % ¹	DC 10 - 30 V
Output level High	≥ 3.5 V (30 mA) ≥ 3.9 V (10 mA)	$\geq U_B - 2.2$ V (30 mA) $\geq U_B - 1.8$ V (10 mA)
Output level Low	≤ 1.6 V (30 mA) ≤ 1.2 V (10 mA)	≤ 1.6 V (30 mA) ≤ 1.2 V (10 mA)
Rise time (1.5 m Cable)	≤ 0.1 μ s	≤ 0.2 μ s
Drop time (1.5 m Cable)	≤ 0.05 μ s	≤ 0.1 μ s

¹ on request

Control inputs

Input	Level logical (physical)	Function
Direction	1 (+ U_B or open) 0 (0 V)	ascending code values when turning clockwise (cw) descending code values when turning clockwise (cw)
Latch	1 (+ U_B or open) 0 (0 V)	encoder data continuously changing at output encoder data stored and constant at output
Tristate (with singleturn)	1 (+ U_B or open) 0 (0 V)	outputs active outputs at high impedance (Tristate mode)
Tristate (with multiturn)	1 (+ U_B) 0 (0 V or open)	outputs at high impedance (Tristate mode) outputs active

Typical actuating delay time 10 μ s with push-pull selection; when selected via O.C., an external pull-down resistor (1 K Ω) is required

ELECTRICAL CONNECTIONS

Singleturn, cable

Colour (PVC)	9 Bit / 360 incr.	10 Bit / 720 incr.	12 Bit	13 Bit	14 Bit
grey/pink	N.C.	N.C.	N.C.	N.C.	S0 (LSB)
brown/yellow	N.C.	N.C.	N.C.	S0 (LSB)	S1
brown/grey	N.C.	N.C.	S0 (LSB)	S1	S2
red/blue	N.C.	N.C.	S1	S2	S3
violet	N.C.	S0 (LSB)	S2	S3	S4
white/brown	S0 (LSB)	S1	S3	S4	S5
white/green	S1	S2	S4	S5	S6
white/yellow	S2	S3	S5	S6	S7
white/grey	S3	S4	S6	S7	S8
white/pink	S4	S5	S7	S8	S9
white/blue	S5	S6	S8	S9	S10
white/red	S6	S7	S9	S10	S11
white/black	S7	S8	S10	S11	S12
brown/green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
yellow	Tristate S0...S8	Tristate S0...S9	Tristate S0...S11	Tristate S0...S12	Tristate S0...S13
pink	Latch	Latch	Latch	Latch	Latch
green	Direction	Direction	Direction	Direction	Direction
black	0 V	0 V	0 V	0 V	0 V
red	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V
brown	Alarm	Alarm	Alarm	Alarm	Alarm

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ELECTRICAL CONNECTIONS

Singleturn, M23 connector (Conin), 17 pole

Pin	9 Bit / 360 incr.	10 Bit / 720 incr.	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S12 (MSB)	S13 (MSB)
2	S1	S1	S1	S11	S12
3	S2	S2	S2	S10	S11
4	S3	S3	S3	S9	S10
5	S4	S4	S4	S8	S9
6	S5	S5	S5	S7	S8
7	S6	S6	S6	S6	S7
8	S7	S7	S7	S5	S6
9	S8 (MSB)	S8	S8	S4	S5
10	N.C.	S9 (MSB)	S9	S3	S4
11	N.C.	N.C.	S10	S2	S3
12	$\overline{\text{Tristate S0...S8}}$	$\overline{\text{Tristate S0...S9}}$	S11 (MSB)	S1	S2
13	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	S0 (LSB)	S1
14	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	S0 (LSB)
15	0 V	0 V	0 V	0 V	0 V
16	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V
17	Alarm	Alarm	Alarm	Latch/Alarm	Latch/Alarm

ELECTRICAL CONNECTIONS

Multiturn, cable

Cable (TPE)			Cable (TPE)		
Colour	Pin	Connection	Colour	Pin	Connection
brown	2	S0	white/blue	14	M4 ¹
green	21	S1	brown/blue	33	M5 ¹
yellow	3	S2	white/red	15	M6 ¹
grey	22	S3	brown/red	34	M7 ¹
pink	4	S4	white/black	16	M8 ²
violet	23	S5	brown/black	35	M9 ²
grey/pink	5	S6	grey/green	17	M10 ²
red/blue	24	S7	yellow/grey	36	M11 ²
white/green	6	S8	pink/green	18	Alarm
brown/green	25	S9	yellow/pink	10	Direction
white/yellow	7	S10	green/blue	30	Latch
yellow/brown	26	S11	yellow/blue	12	Tristate
white/grey	8	M0	red (0.5mm ²)	13	DC 10-30 V
grey/brown	27	M1	white (0.5mm ²)	31	DC 10-30 V
white/pink	9	M2	blue (0.5mm ²)	1	0 V
pink/brown	28	M3	black (0.5mm ²)	20	0 V

¹ N. C. with resolution 16 Bit (4 Bit MT)

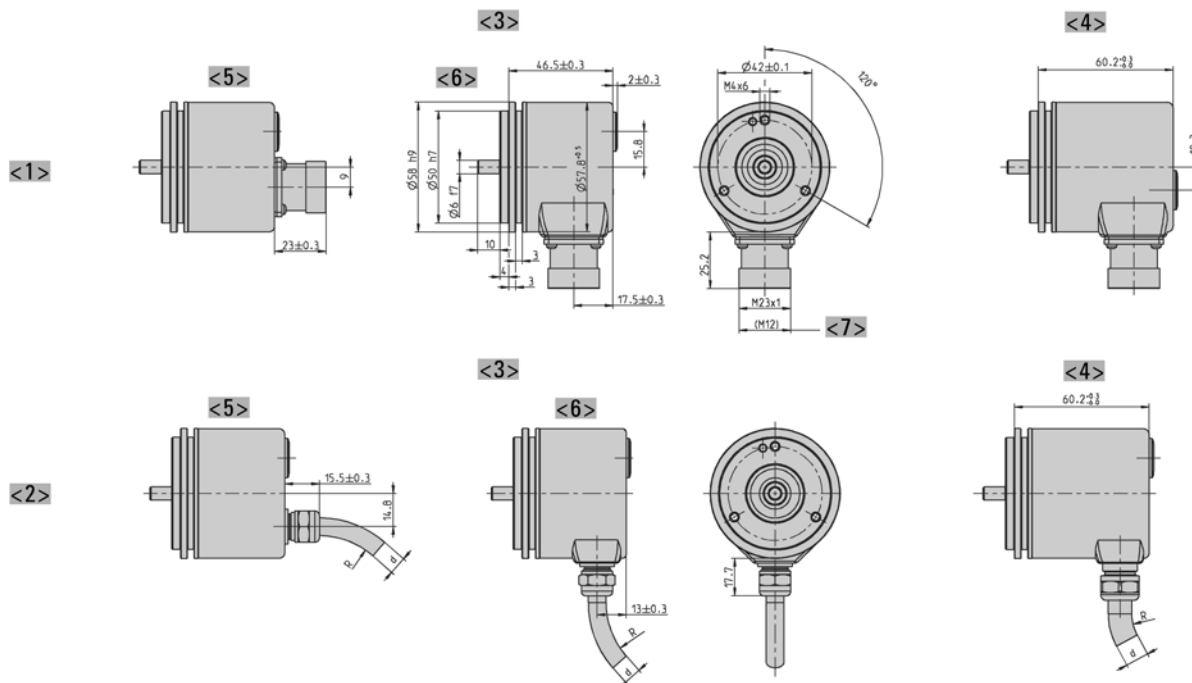
² N. C. with resolution 16 Bit or 20 Bit (4 or 8 Bit MT)

TECHNICAL DATASHEET

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DIMENSIONED DRAWINGS

Synchro flange "S"



- <1> Connection M23 (Conin)
- <2> Connection cable
- <3> Interface: BiSS, SSI, ST-Parallel
- <4> Interface: MT-Parallel (only with cable), Fieldbus, SSI-P
- <5> axial
- <6> radial
- <7> Value in brackets alternative at SSI

- Cable bending radius R for flexible installation $\geq 15 \times$ cable diameter
- Cable bending radius R for fixed installation $\geq 7.5 \times$ cable diameter
- Cable \varnothing d BiSS/SSI/SSI-P: $7,1^{+1,2}$
- Cable \varnothing d ST-P: $7,8^{+0,9}$
- Cable \varnothing d MT-P: $9,3^{+1,3}$
- Cable \varnothing d Fieldbus: $7,1^{+1,2}$

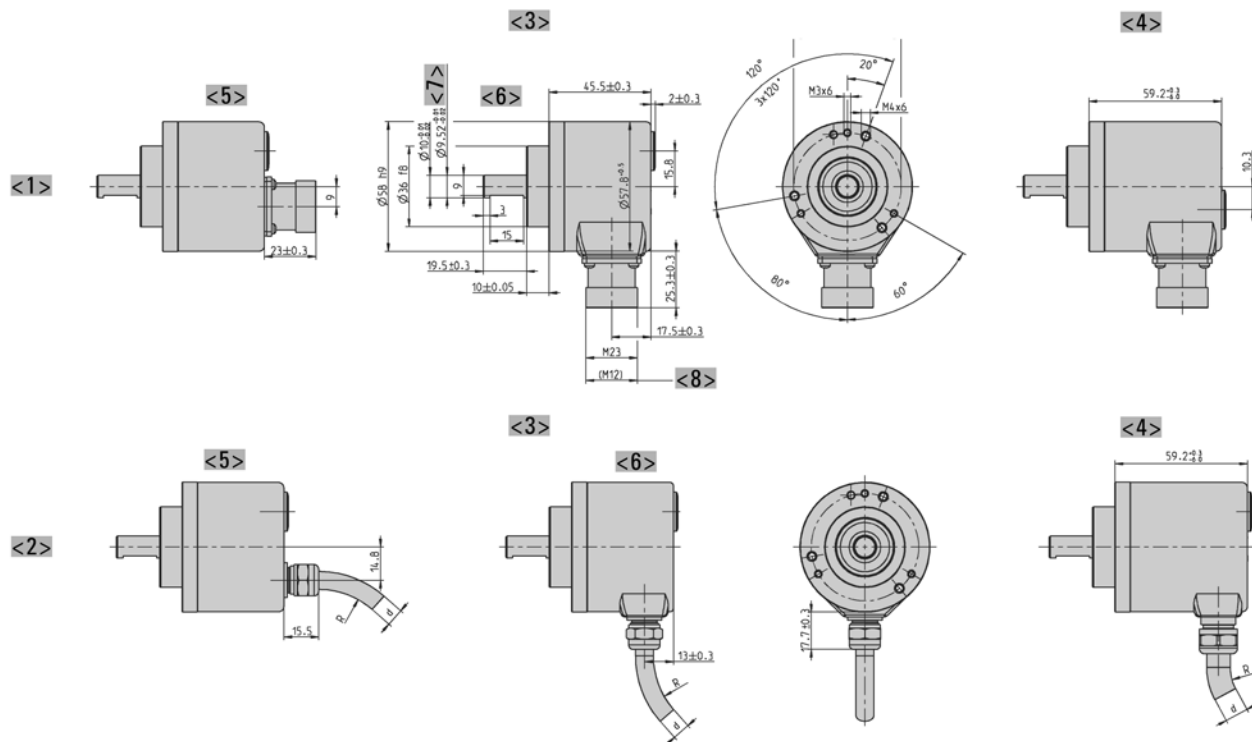
Dimensions in mm

TECHNICAL DATASHEET

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DIMENSIONED DRAWINGS (continued)

Clamping flange "K"



<1> Connection M23 (Conin)

<2> Connection cable

<3> Interface: BiSS, SSI, ST-Parallel

<4> Interface: MT-Parallel (only with cable), Fieldbus, SSI-P

<5> axial

<6> radial

<7> alternative

<8> Value in brackets alternative at SSI

Cable bending radius R for flexible installation $\geq 15 \times$ cable diameter

Cable bending radius R for fixed installation $\geq 7.5 \times$ cable diameter

Cable \varnothing d BiSS/SSI/SSI-P: $7,1^{+1,2}$

Cable \varnothing d ST-P: $7,8^{+0,9}$

Cable \varnothing d MT-P: $9,3^{+1,3}$

Cable \varnothing d Fieldbus: $7,1^{+1,2}$

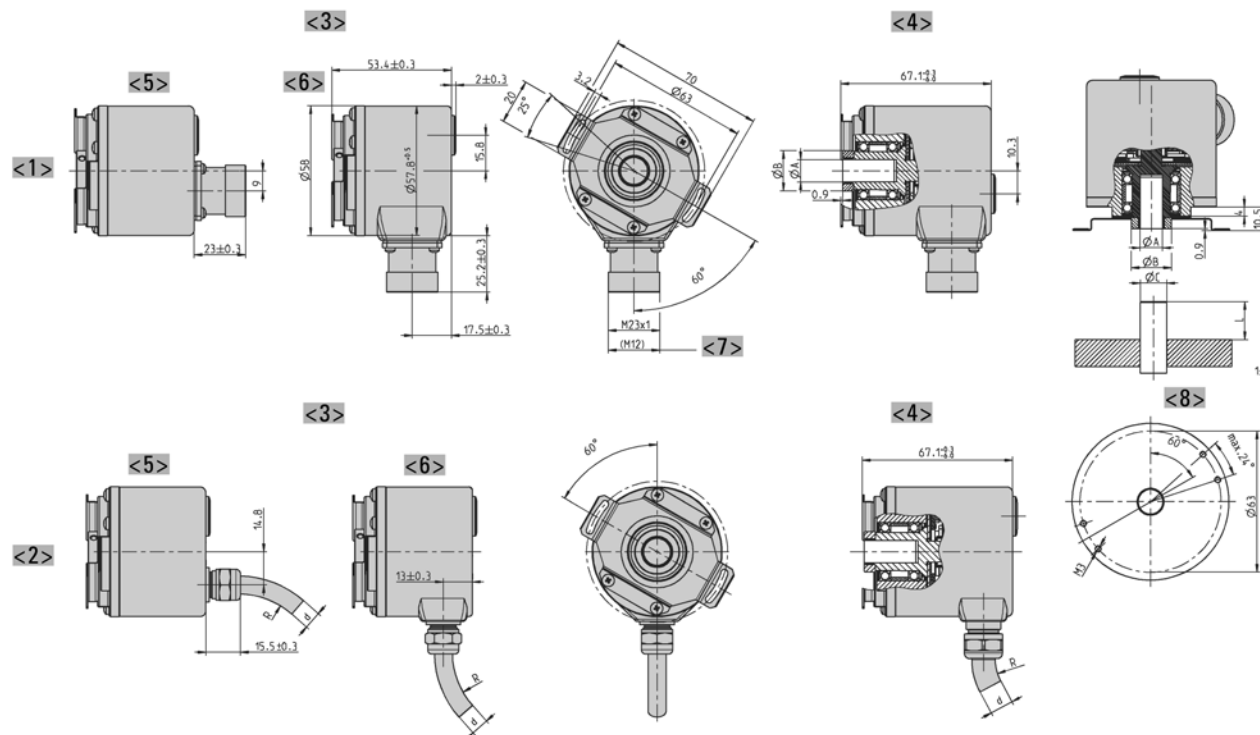
Dimensions in mm

TECHNICAL DATASHEET

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DIMENSIONED DRAWINGS (continued)

Hollow shaft "F"



	Dim.				Unit
	<5>	<6>	<3>	<3>	
Hollow shaft Ø A	10 ^{+0.012}	12 ^{+0.012}	9,52 ^{+0.012}	12,7 ^{+0.012}	mm
Connecting shaft Ø C	10 _{g7}	12 _{g7}	9,52 _{g7}	12,7 _{g7}	mm
Clamping ring Ø B	18	20	18	22	mm
L _{min}	15	18	15	18	mm
L _{max}	20	20	20	20	mm
Shaft code	"2"	"7"	"6"	"E"	

L = Inside length of connection shaft

- <1> Connection M23 (Conin)
 - <2> Connection cable
 - <3> Interface: BiSS, SSI, ST-Parallel
 - <4> Interface: MT-Parallel (only with cable), Fieldbus, SSI-P
 - <5> axial
 - <6> radial
 - <7> Value in brackets alternative at SSI
 - <8> Customer side
- Cable bending radius R for flexible installation $\geq 15 \times$ cable diameter
 Cable bending radius R for fixed installation $\geq 7.5 \times$ cable diameter
 Cable Ø d BiSS/SSI/SSI-P: 7,1^{+1,2}
 Cable Ø d ST-P: 7,8^{+0,9}
 Cable Ø d MT-P: 9,3^{+1,3}
 Cable Ø d Fieldbus: 7,1^{+1,2}

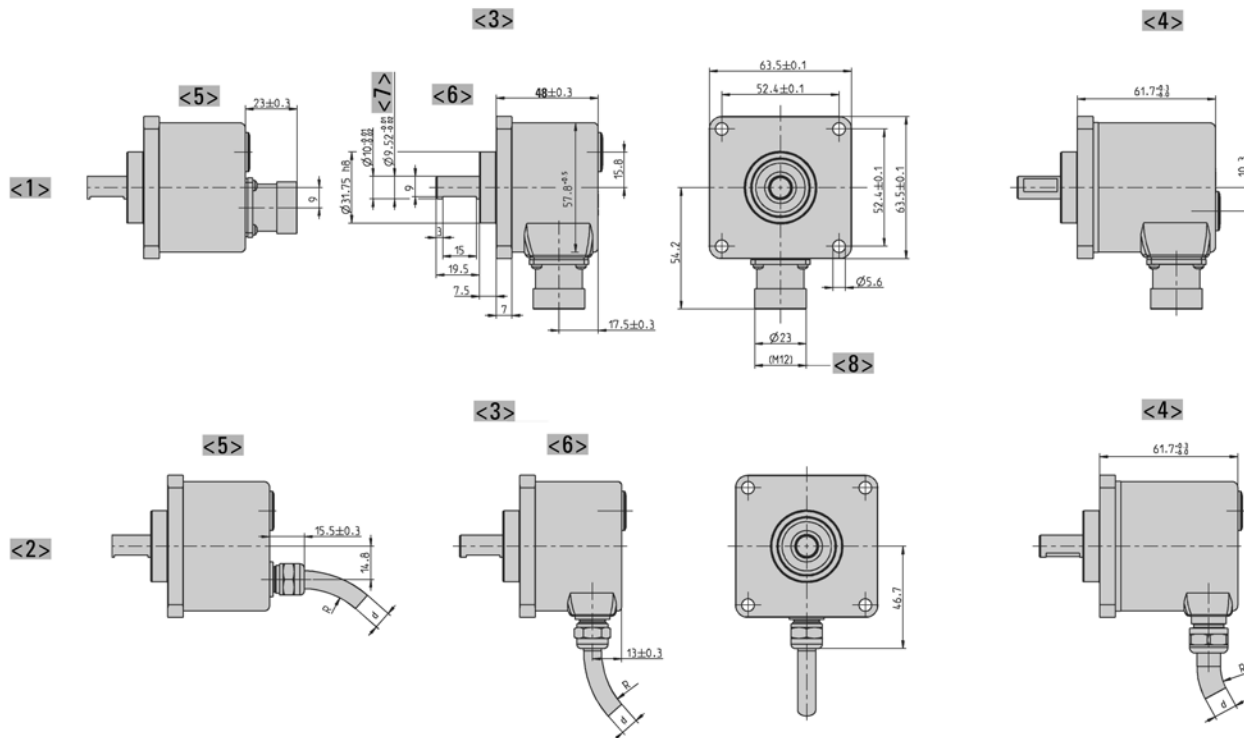
Dimensions in mm

TECHNICAL DATASHEET

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DIMENSIONED DRAWINGS (continued)

Square flange "Q"



<1> Connection M23 (Conin)

<2> Connection cable

<3> Interface: BiSS, SSI, ST-Parallel

<4> Interface: MT-Parallel (only with cable), Fieldbus, SSI-P

<5> axial

<6> radial

<7> alternative

<8> Value in brackets alternative at SSI

Cable bending radius R for flexible installation $\geq 15 \times$ cable diameter

Cable bending radius R for fixed installation $\geq 7.5 \times$ cable diameter

Cable \varnothing d BiSS/SSI/SSI-P: $7,1^{+1,2}$

Cable \varnothing d ST-P: $7,8^{+0,9}$

Cable \varnothing d MT-P: $9,3^{+1,3}$

Cable \varnothing d Fieldbus: $7,1^{+1,2}$

Dimensions in mm

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ORDERING INFORMATION

Type	Resolution ^{1,2}	Supply voltage	Flange, Protection, Shaft ^{3,7}	Interface	Connection ^{4,5,6}
<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>
AC58	0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0360 360 increments ST 0720 720 increments ST 0412 4 Bit MT + 12 Bit ST 0812 8 Bit MT + 12 Bit ST 1212 12 Bit MT + 12 Bit ST	E DC 10 - 30 V	S.41 Synchro, IP64, 6 mm S.71 Synchro, IP67, 6 mm K.42 Clamping, IP64, 10 mm K.46 Clamping, IP64, 9.52 mm K.72 Clamping, IP67, 10 mm K.76 Clamping, IP67, 9.52 mm F.46 Spring tether, IP64, hubshaft 9.52 mm, mounting with clamping ring front F.42 Spring tether, IP64, hubshaft 10 mm, mounting with clamping ring front F.47 Spring tether, IP64, hubshaft 12 mm, mounting with clamping ring front Q.46 Square, IP64, 9.52 mm Q.42 Square, IP64, 10 mm Q.76 Square, IP67, 9.52 mm Q.72 Square, IP67, 10 mm	PB Parallel binary PG Parallel Gray	A Cable, axial B Cable, radial U M23 connector (Conin), 17 pole, axial, ccw V M23 connector (Conin), 17 pole, radial, ccw W M23 connector (Conin), 17 pole, axial, cw Y M23 connector (Conin), 17 pole, radial, cw A-A1-F 0,1 m cable with Sub-D connector, 37 pole, axial B-B1-F 0,1 m cable with Sub-D connector, 37 pole, radial

¹ Resolution 360 increments ST with Offset 76 (value range 76...435)

² Resolution 720 increments ST with Offset 152 (value range 152...871)

³ Protection class IP67 not available in combination with preset key and LED display

⁴ Connection code "A", "B" (cable): ST and MT

⁵ Connection code "U", "V", "W", "Y" (M23 connector): only ST

⁶ Connection code "A-A1-F" and "B-B1-F" (Sub-D connector): only MT

⁷ IP67 on cover with connector only if IP67 mating connector mounted properly.

Preferably available versions are printed in bold type.

ORDERING INFORMATION

Selection of cable length

Versions with cable outlet (connection A, B, E or F) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. For variants with connector on cable end please add cable length code in between. Further cable lengths on request.

Code	Cable length
without code	1.5 m
-D0	3 m
-F0	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m

Example:

Cable 3 m length: ... B - D0

Cable mit 3 m length and M23 connector, cw: ... B - D0 - I

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel Accessories

FLEXIBLE COUPLINGS



Bellows coupling



Disk coupling



Helical coupling



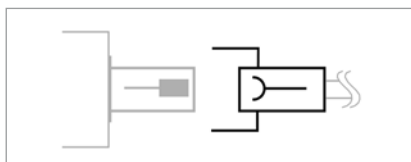
Isolated disk coupling

		Ordering code
Bellows coupling	10 mm / 10 mm	3 520 037
Bellows coupling	6 mm / 6 mm	3 520 068
Bellows coupling	8 mm / 10 mm	3 520 077
Disk coupling	6 mm / 6 mm	0 070 663
Helical coupling 19/28	5 mm / 6 mm	3 520 035
Helical coupling 19/28	6 mm / 6 mm	0 070 653
Helical coupling 19/28	6 mm / 6.35 mm	3 520 051
Helical coupling 25/32	6 mm / 9.53 mm	3 520 052
Helical coupling 25/32	6 mm / 10 mm	3 520 066
Helical coupling 25/32	10 mm / 12 mm	3 520 065
Helical coupling 25/32	10 mm / 10 mm	3 520 074
Isolated disk coupling	6 mm / 6 mm	3 520 081
Isolated disk coupling	6 mm / 10 mm	3 520 082
Isolated disk coupling	10 mm / 10 mm	3 520 088

MOUNTING

	Ordering code
Clamping eccentric, For M4 (set of three)	1 522 300
Clamping eccentric for synchro flange, d6,5 for M3 (set of three)	0 070 655
Fastening angle (plastic), for clamping flange RI 58, AC 58 (fastening material included)	1 522 329
Mounting bell (plastic), for synchro flange RI 58, AC 58 (clamping eccentric and fastening material included)	1 522 330
Square flange adapter 58 x 58 mm, for clamping flange RI 58, AC 58 (fastening material included)	1 522 326
Square flange adapter 80 x 80 mm, for clamping flange RI 58, AC 58 (fastening material included)	1 522 327
Synchro flange adapter , for clamping flange RI 58, AC 58 (fastening material included)	1 522 328
Torque support	1 531 188

CONNECTORS

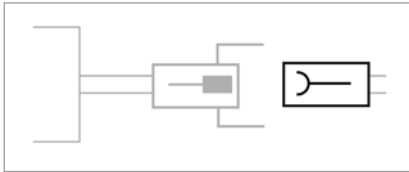


Connector (socket) matching with encoder connector	Ordering code
M23 (Conin), 17 pole, PG9, ccw, mating connector for connection U/V Singleturn	3 539 256
M23 (Conin), 17 pole, PG9, cw, mating connector for connection W/Y Singleturn	3 539 254

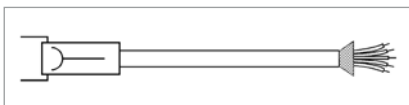
TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel Accessories

CONNECTORS



CONNECTING CABLES



Coupling (socket) matching with encoder cable with connector	Ordering code
SUB-D, 37 pole, mating connector for connection -F (cable plug 1 542 045) Multiturn	1 542 024

Connecting cables with plug (socket) on one end	Ordering code
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 3 m	1 540 100
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 5 m	1 540 101
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 10 m	1 540 102
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 15 m	1 540 142
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 20 m	1 540 143
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 25 m	1 540 144
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 30 m	1 540 145
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 40 m	1 540 205
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), cw, mating connector for connection W/Y, 50 m	1 540 206
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 3 m	1 540 097
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 5 m	1 540 098
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 10 m	1 540 099
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 15 m	1 540 138
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 20 m	1 540 139
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 25 m	1 540 140
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 30 m	1 540 141
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 40 m	1 540 207
M23 (Conin), 17-polig, PVC cable (Singleturn 12 Bit pin assignment!), ccw, mating connector for connection U/V, 50 m	1 540 208
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 1 m	1 542 163
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 3 m	1 542 020
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 5 m	1 542 021
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 10 m	1 542 022

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel Accessories

CONNECTING CABLES (continued)

Connecting cables with plug (socket) on one end	Ordering code
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 15 m	1 542 172
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 20 m	1 542 173
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 25 m	1 542 174
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 30 m	1 542 175
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 40 m	1 542 176
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 50 m	1 542 177

CONNECTING CABLES

Cable not made up with connectors	Ordering code
PVC cable, 20-core + screen	3 280 100 + length
TPE cable, 32-core + screen	3 280 221 + length